Report Topic: High-Quality Pavement Marking Materials and Wet-Night Retro Reflectivity Pilot Projects

STATE TRUNKLINE FUND

Section 611, Public Act 361, 2004 states the following:

From the appropriations in part 1, the department shall use high-quality pavement marking materials for all state trunkline projects with a design life of 10 years or greater. The department shall coordinate with material suppliers, equipment manufacturers, and application contractors to ensure cost-effective improvements in durability and retro-reflectivity. The department shall identify pilot projects for demonstration of wet reflective characteristics. The department shall submit a report to both the house and senate appropriations committees and the house and senate fiscal agencies by January 31, 2006, that provides a report on the wet reflective pilot projects and the use of high-quality pavement marking materials in coordination with material suppliers, equipment manufacturers, and application contractors.

The Michigan Department of Transportation continues in it's commitment to using high-quality pavement markings that provide drivers the positive guidance necessary to safely navigate Michigan's roadways.

Wet Night Reflective Pilot Projects

Painted Shoulder Corrugations (Rumble Strips)
Prior to the passing of PA 162 of 2003 the Michigan Department of Transportation (MDOT) in conjunction with the Michigan State University (MSU) Department of Civil Engineering had begun research involving painted shoulder corrugations (rumble strips). As noted in the 2004 report to the Legislature, this research has shown a painted rumble strip provides a driver with a cost-effective pavement marking that can be seen at night in the rain. MDOT is the national leader in this area.

Continued research has indicated drivers position themselves in a lane based on the location of the painted edge line. Because of this, MDOT has opted for the use of an auxiliary three inch wide solid marking in the rumble strip rather than placing the edge line marking directly in the rumble strip. This will lessen the noise from incidental hits, and keep vehicles away from the shoulder joint line. Painted rumble strips provide not only wet night visibility, but also protect the paint line from damage due to snowplows. The use of painted rumble strips continues to expand in Michigan and nationwide.

3M Stamark 380© Wet Reflective (WR) Tape
The product, 3M Stamark 380©WR tape, commonly called "wet tape", has replaced a product used in Michigan since 2002. That product was called 3M Stamark 820©WR tape. The 380©WRtape has wet night retro reflective characteristics, as do the painted

rumble strips. At this time, these are the two treatments available for use on Michigan freeways.

The 380©WR is on the Qualified Product List (QPL). Having the material on the QPL makes it available for use as a standard, non-experimental item.

Polyurea with Wet Night Retro Reflective Elements
A material set up for pilot projects in 2006 is polyurea with wet night retro reflective elements. One location approximately one mile long has been placed on I-75 southbound near Birch Run, but a number of projects will be done during the 2006 construction season. MDOT will evaluate the performance of this new type of material.

The element was developed by 3M. It is applied on top of polyurea while wet, along with glass beads. The research information provided to MDOT from 3M indicates the markings should be highly visible even in dark rainy conditions.

High-Quality Marking Materials

In partnership with representatives from Michigan Road Builders (MRBA), now known as MITA, and MITA members from the pavement marking industry, a definition of high-quality pavement markings was agreed upon. This agreement lead to the issuing of the November 20, 2003 Bureau of Highway Informational Memorandum 2003-17 (BOHIM 2003-17) entitled "Upgrading of Pavement Markings on Future Pavement Construction/ Reconstruction Projects".

Polyurea recessed in a groove was identified as a high-quality durable marking. Recently, MDOT has taken this requirement further. In November 2005 MDOT began requiring the use of a large, higher quality optics system on all new application of polyurea. This system of large and small beads or ceramic elements provides a much brighter line with 'wet recovery' characteristics. That means water runs off the marking more quickly and reflects better at night in the rain. A number of pilot projects were done in the summer of 2005 using the better quality bead system, starting with a project on US-131 just north of I-94 in the Southwest Region.

MDOT is looking at another material to see if it can fit in the matrix of durable materials. It is called Modified Urethane and was recessed on US-131 near Big Rapids, which also uses the large bead system. It may not be as durable as polyurea, but may fit in to the family of durable markings.

Since snowplow damage to pavement markings is a common problem, all high quality durable marking materials are recessed in a shallow groove in the pavement.

Coordination with Material Suppliers and Application Contractors

(Note - Equipment manufacturers work directly with suppliers and application contractors.)

- Coordinated with Industry Representatives; developed language for the new Special Provision for Polyurea Pavement Markings. Made the use of large beads/ elements standard, greatly improving the retro reflectivity and wet night recovery of the material.

- Worked with representatives of 3M. Their Stamark 820© wet tape was removed from the QPL, and replaced with their new generation Stamark 380© wet night retro reflective tape.

- Set up pilot projects to evaluate wet night retro reflective polyurea in 2006 by coordinating with Suppliers, Contractors and MDOT personnel.

- Placed Modified Urethane test deck by coordinating with Application Contractor and MDOT Personnel.

These meetings and coordinated evaluations cleared the way for implementation of the upgrading of pavement markings on MDOT construction projects.

The MDOT recognizes the need for quality pavement markings. As the population ages, upgraded pavement markings will prove beneficial, not only to the older driver, but to all drivers.